

THAT WHICH IS CLAIMED IS:

1. A process for activating a platinum-containing reforming catalyst contained in a multiple reaction zone system, said process comprises:

(a) reducing said platinum-containing reforming catalyst with hydrogen;

(b) simultaneously with step (a) contacting said platinum-containing reforming catalyst with a nonmetallic chlorine-containing compound by introducing said nonmetallic chlorine-containing compound serially into each reaction zone of said multiple reaction zone system under conditions to effect decomposition of said nonmetallic chlorine-containing compound thereby providing a chlorine-treated catalyst; and (c) thereafter purging said chlorine-treated catalyst with about 100 to about 50,000 cubic feet of hydrogen per cubic foot of said chlorine-treated catalyst prior to using said chlorine-treated catalyst in a reforming process.

2. A process according to claim 1 wherein said contacting is carried out at a temperature in the range of about 700°F to about 1,200°F and a pressure in the range of about 0 to about 600 psig.

3. A process according to claim 2 wherein said purging is carried out at a temperature in the range of about 800°F to about 1,100°F and a pressure in the range of about 0 to about 600 psig.

4. A process according to claim 1 wherein said nonmetallic chlorine-containing compound is added to said platinum-containing reforming catalyst in an amount sufficient to add from 0.05 to about 0.3 pounds of chlorine per pound of said platinum-containing reforming catalyst.

5. A process according to claim 4 wherein said nonmetallic chlorine-containing compound is selected from the group consisting of tetrachloroethylene, hexachlorethane, carbon tetrachloride, 1-chlorobutane, 1-chloro-2-methyl propane, 2-chloro-2-methyl propane, tertiary butyl chloride, propylene dichloride, perchloroethylene, and mixtures of two or more thereof.

6. A process according to claim 5 wherein said nonmetallic chlorine-containing compound is perchloroethylene.

7. A process for regenerating a deactivated reforming catalyst contained in a multiple reaction zone system and which has become deactivated through employment in the reforming of a hydrocarbon, said process comprises: (a) purging said multiple reaction zone system with nitrogen; (b) subjecting said deactivated reforming catalyst to an oxidative burning off at a temperature and for a period of time sufficient to remove substantially all carbonaceous deposits thereon thereby providing a substantially carbon free catalyst; (c) subjecting said substantially carbon free catalyst to an oxygen treatment with a gas containing molecular oxygen at a temperature and for a

10 time sufficient to effect the oxidation of the metals contained in said
substantially carbon free catalyst thereby providing an oxidized catalyst; (d)
purging said oxidized catalyst of molecular oxygen thereby providing a purged
catalyst; (e) cooling said purged catalyst thereby providing a cooled catalyst; (f)
15 reducing said cooled catalyst with hydrogen, said hydrogen being introduced
into a reaction zone of said multiple reaction zone system; (g) simultaneously
with step (f) contacting said cooled catalyst with a nonmetallic
chlorine-containing compound in a quantity sufficient to provide from about
0.05 to about 0.3 weight percent chlorine on said cooled catalyst by introducing
20 said nonmetallic chlorine-containing compound serially into each reaction zone
of said multiple reaction zone system under conditions to effect decomposition
of said nonmetallic chlorine-containing compound thereby providing a
chlorine-treated catalyst; (h) thereafter purging said chlorine-treated catalyst
with about 100 to about 50,000 cubic feet of hydrogen per cubic foot of said
chlorine-treated catalyst at a temperature in the range of about 700°F to about
25 1,200°F and a pressure in the range of about 0 to about 600 psig prior to
introducing hydrocarbon into said multiple reaction zone system.

8. A process according to claim 7 wherein said oxidative
burning off step (b) is carried out at a temperature in the range of from about

300°F to about 1,300°F and for a period of time in the range of about 4 to about 36 hours.

9. A process according to claim 8 wherein said oxygen treatment step (c) said gas contains from about 5 to about 15 percent by volume of molecular oxygen.

10. A process according to claim 9 wherein said oxygen treatment step (c) is carried out at a temperature in the range of about 800°F to about 1,150°F.

11. A process according to claim 7 wherein said purged catalyst is cooled to a temperature in the range of about 600°F to about 1,000°F.

12. A process according to claim 7 wherein step (f) and step (g) are carried out at a temperature in the range of about 900°F to about 940°F and at a pressure in the range of from about 50 to about 300 psig.

13. A process according to claim 7 wherein said deactivated reforming catalyst is a platinum-on-alumina reforming catalyst.

14. A process according to claim 13 wherein said platinum-on-alumina reforming catalyst also contains at least one metal selected from the group consisting of rhenium, iridium, ruthenium, tin, palladium, germanium, and combinations of two or more thereof.

15. A process according to claim 7 wherein said nonmetallic chlorine-containing compound is selected from the group consisting of tetrachloroethylene, hexachlorethane, carbon tetrachloride 1-chlorobutane, 1-chloro-2-methyl propane, 2-chloro-2-methyl propane, tertiary butyl chloride, propylene dichloride, perchloroethylene, and mixtures of two or more thereof.

16. A process according to claim 15 wherein said nonmetallic chlorine-containing compound is perchloroethylene.

17. In a process for reforming naphthene and paraffin-containing petroleum hydrocarbons of gasoline or naphtha boiling range in the presence of molecular hydrogen wherein there is employed in series a plurality of catalytic reaction zones to provide reformates, the improvement which comprises utilizing in said catalytic reaction zones a catalyst activated by the process of claim 1.

18. In a process for reforming naphthene and paraffin-containing petroleum hydrocarbons of gasoline or naphtha boiling range in the presence of molecular hydrogen wherein there is employed in series a plurality of catalytic reaction zones to provide reformates, the improvement which comprises using said catalytic reaction zone a catalyst regenerated and activated by the process of claim 7.

19. The activated catalyst system of claim 1.

20. The activated catalyst system of claim 7.

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